

Amendments to the Claims

Please cancel claims 1-8 and add new claims 9-19 as indicated below:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (New) An imaging system, comprising:

an active pixel image sensor array comprising a plurality of pixels;

at least one analog to digital converter for sampling and converting analog information from pixels in said array to digital values; and

a digital memory array for storing and accumulating said digital values;

wherein each pixel in said active pixel image sensor array is sampled multiple times during an integration period and each sampled value is stored in said digital memory array.

10. (New) The imaging system of claim 9, wherein said active pixel image sensor array is a CMOS image sensor.

11. (New) The imaging system of claim 9, wherein said at least one analog to digital converter is an oversampling converter.

12. (New) The imaging system of claim 9, further comprising an analog signal processor including column analog double sampling circuitry.

13. (New) The imaging system of claim 12, wherein said column analog double sampling circuitry samples both a signal and a reference for decreasing pixel fixed pattern noise.

14. (New) The imaging system of claim 12, wherein said analog signal processor further comprises at least one preamplifier with adjustable gain.

15. (New) The imaging system of claim 9, wherein said at least one analog to digital converter comprises a column analog to digital converter for each pixel column of said active pixel image sensor array.

16. (New) The imaging system of claim 9, further comprising at least one digital signal processor coupled between said at least one analog to digital converter and said digital memory array.

17. (New) The imaging system of claim 16, wherein stored multiple sampled digital values for each pixel stored in said digital memory array are used to provide an integrated output signal for each pixel.

18. (New) A method of acquiring an image, comprising:

forming an active pixel image sensor array on a semiconductor substrate;

using said active pixel image sensor array to image a scene and to produce image output information;

sampling and converting an analog output signal representing incident light for each pixel of said active pixel image sensor array to a digital value for each frame of the image a plurality of times during a desired integration period; and

storing each of the digital values in a digital memory.

19. (New) The method of claim 18, wherein said active pixel image sensor array is a CMOS image sensor.

20. (New) The method of claim 18, further comprising using the stored digital values for each pixel to produce an integrated pixel output signal for said integration period.

21. (New) A semiconductor chip, comprising:

a substrate comprising:

an active pixel image sensor array comprising a plurality of pixels;

at least one analog to digital converter for sampling and converting analog information from pixels in said array to digital values; and

a digital memory array for storing and accumulating said digital values;

wherein each pixel in said active pixel image sensor array is sampled multiple times during an integration period and each sampled value is stored in said digital memory array.